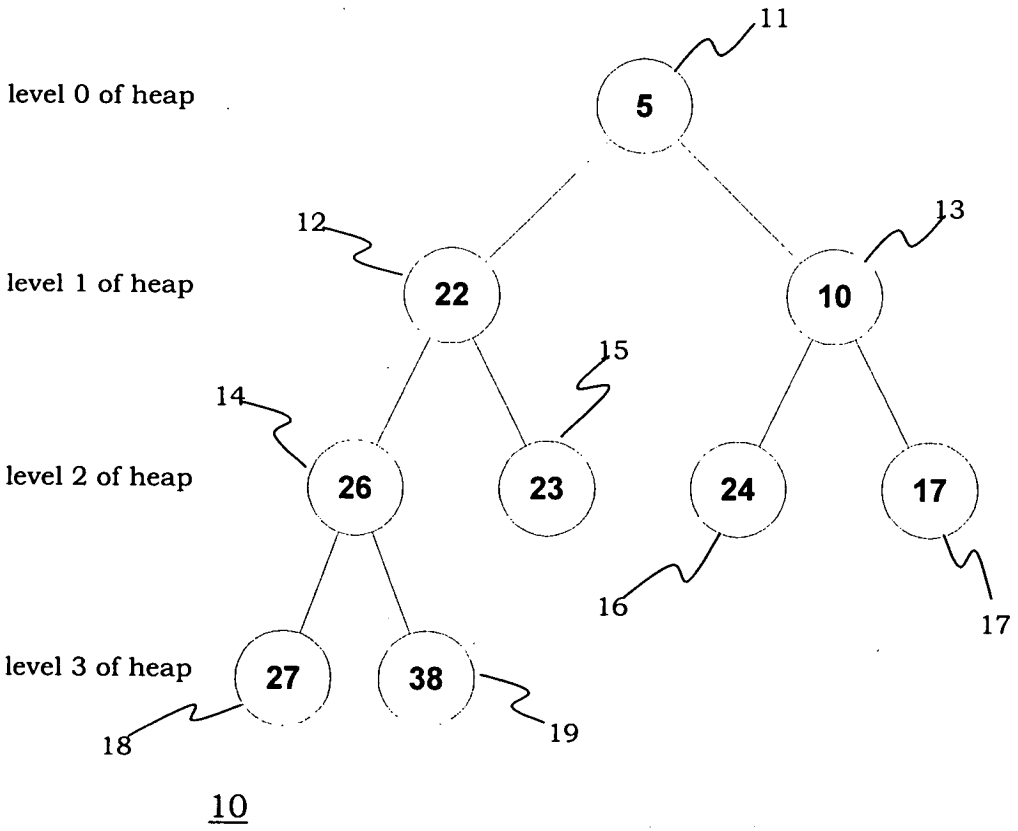


FIGURE 1
(Prior Art)

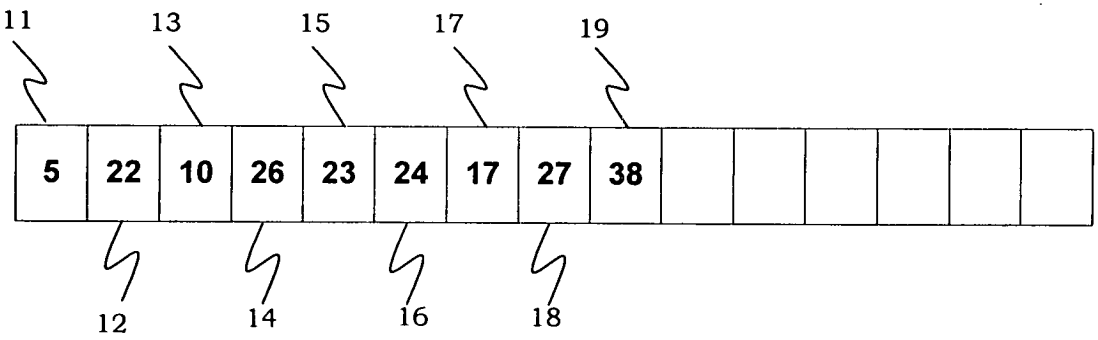


FIGURE 2
(Prior Art)

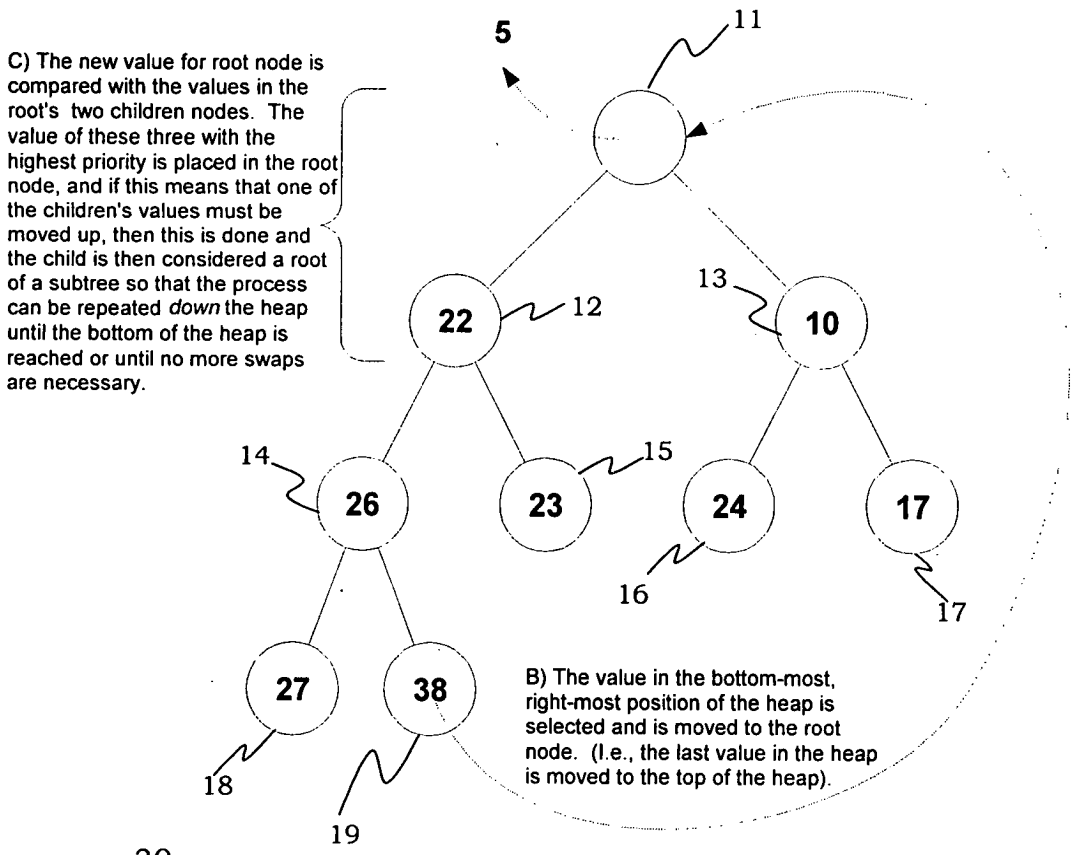
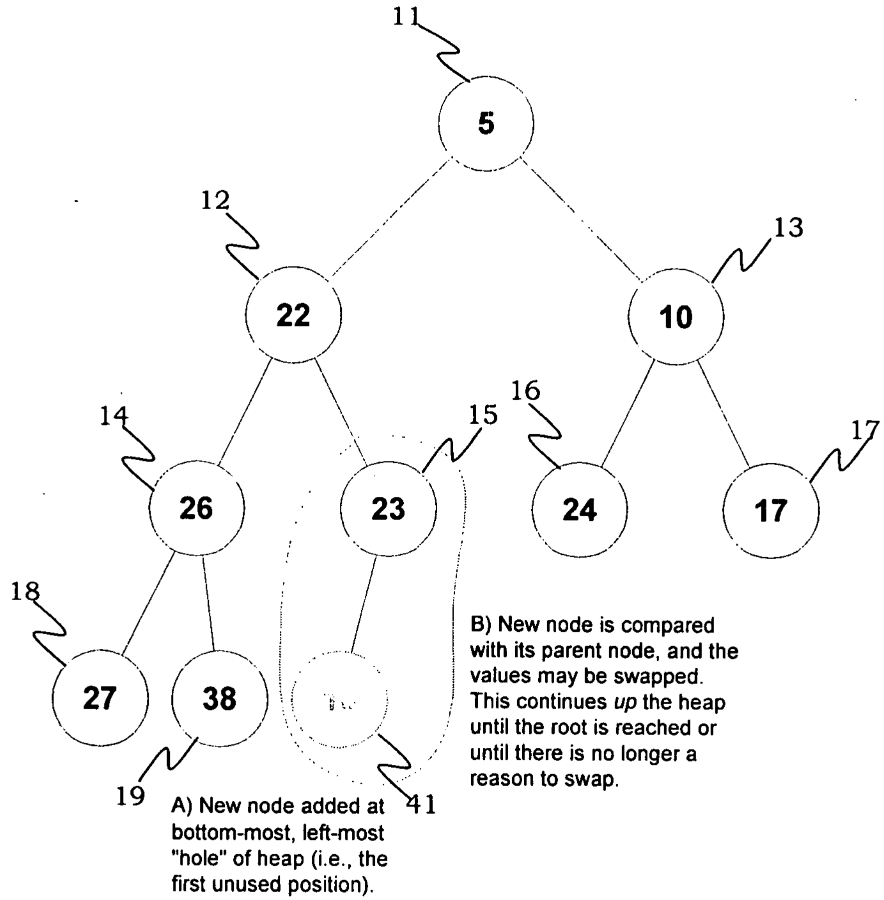


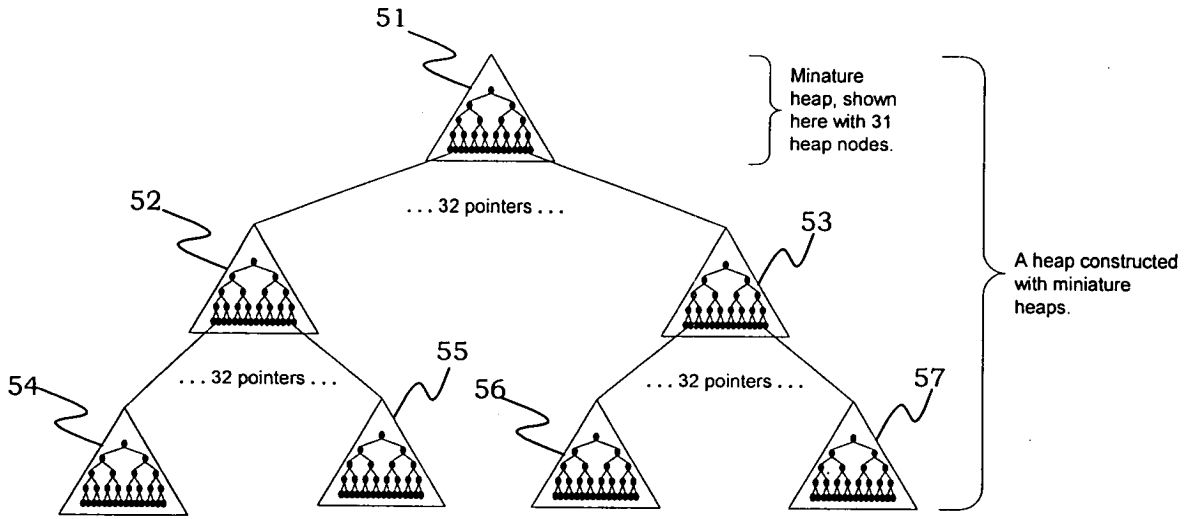
FIGURE 3
(Prior Art)



40

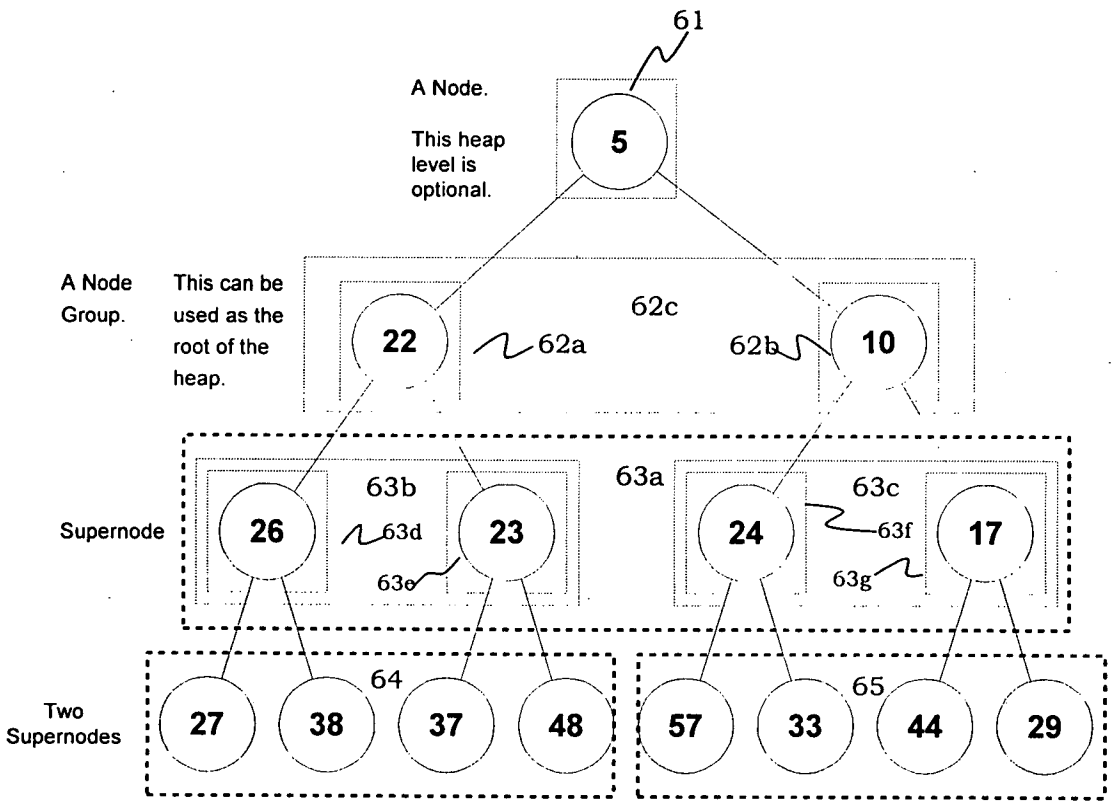
FIGURE 4

(Prior Art)


51
Minature heap, shown here with 31 heap nodes.
52
. . . 32 pointers . . .
53
A heap constructed with miniature heaps.
55
54
. . . 32 pointers . . .
56
. . . 32 pointers . . .
57

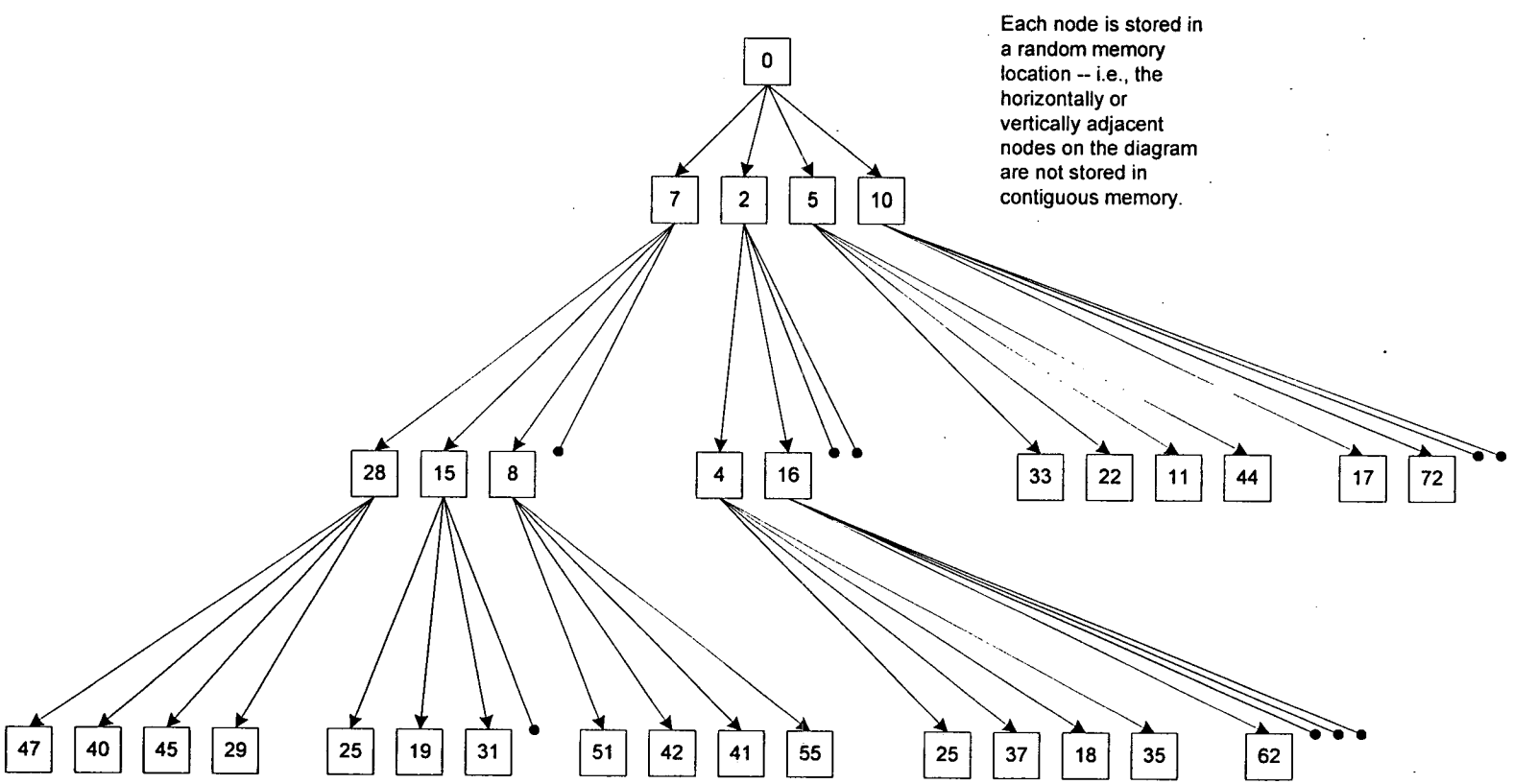
50

FIGURE 5


61
A Node.
This heap level is optional.
5
A Node Group.
This can be used as the root of the heap.
22
62a
62c
62b
10
Supernode
63b
63a
63c
26
63d
23
24
63f
17
63e
63g
64
65
Two Supernodes
27
38
37
48
57
33
44
29

60

FIGURE 6


Each node is stored in a random memory location -- i.e., the horizontally or vertically adjacent nodes on the diagram are not stored in contiguous memory.
0
7
2
5
10
28
15
8
4
16
33
22
11
44
17
72
47
40
45
29
25
19
31
51
42
41
55
25
37
18
35
62

70

FIGURE 7

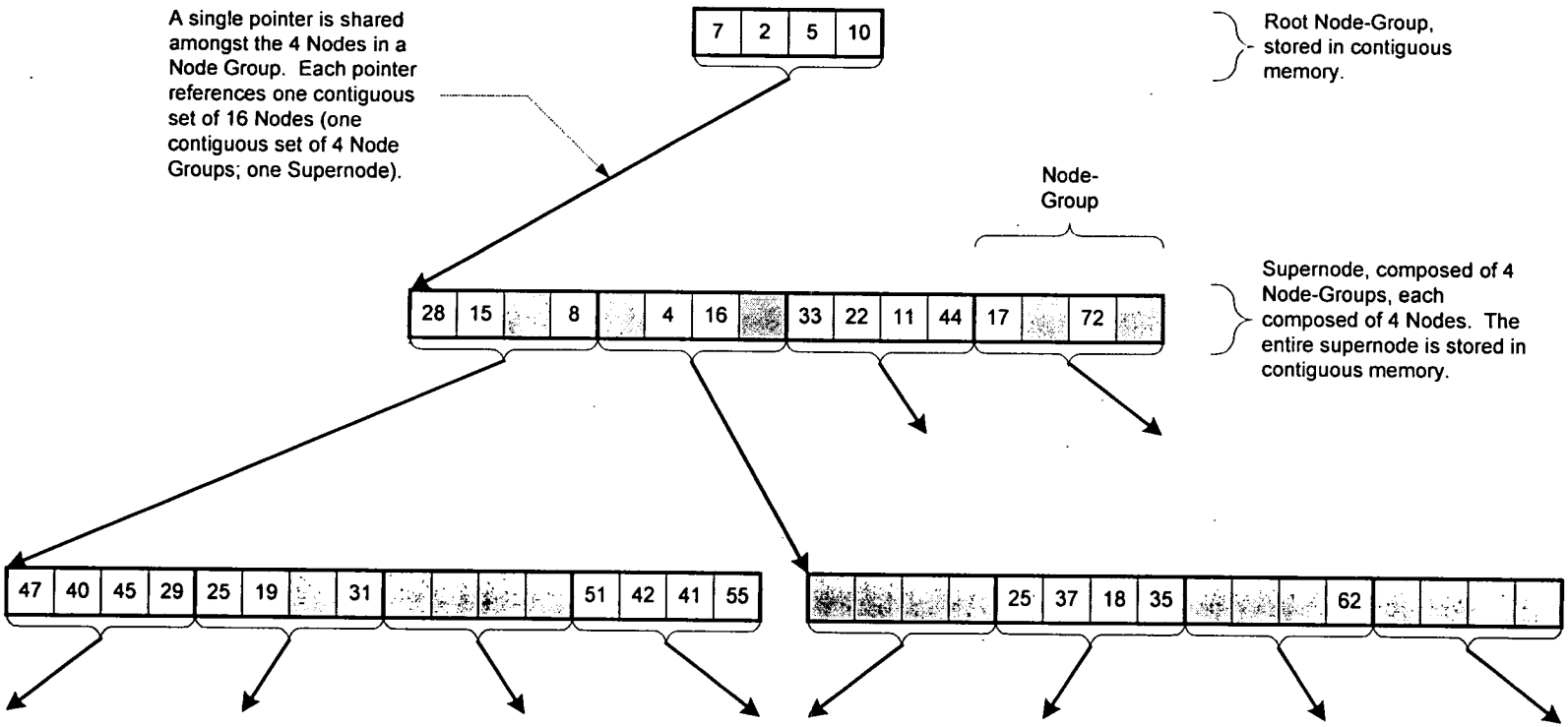
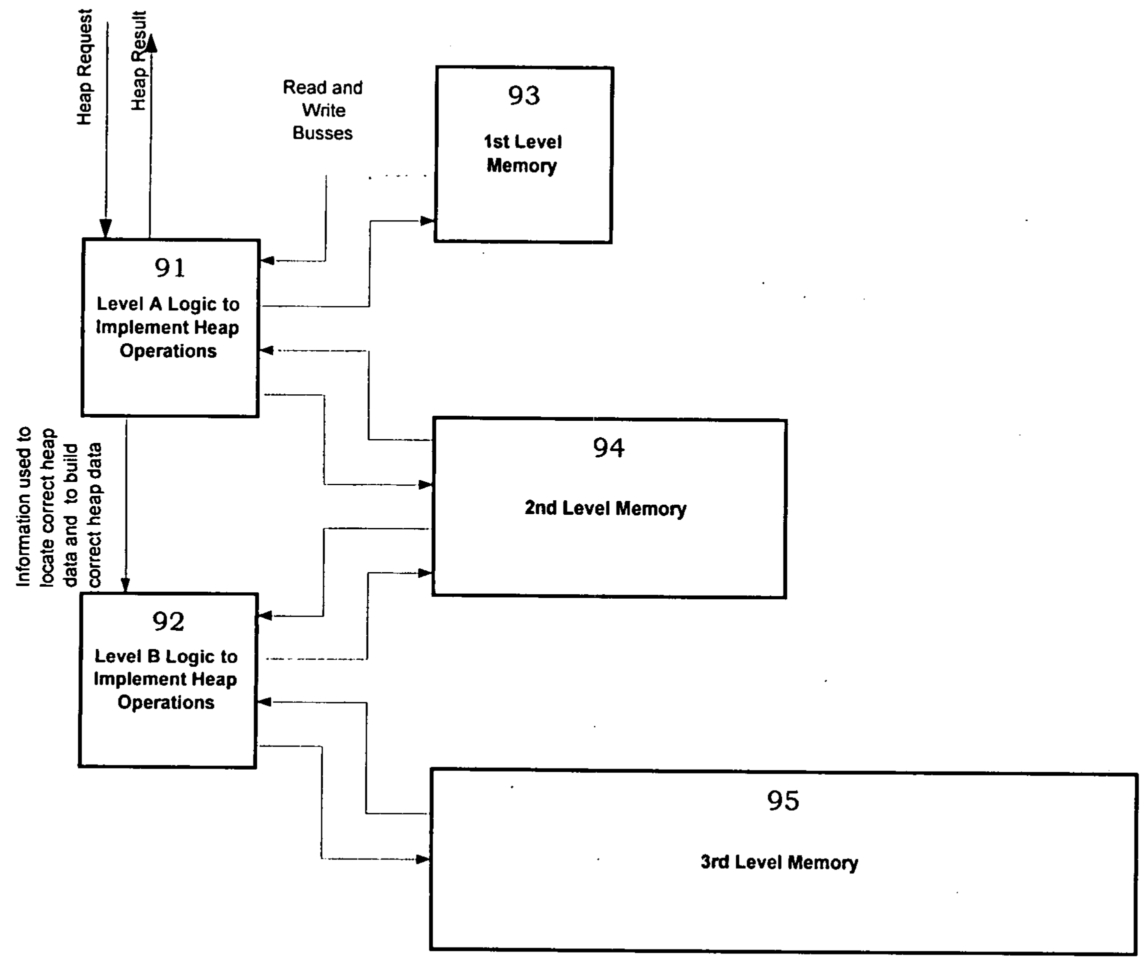

A single pointer is shared amongst the 4 Nodes in a Node Group. Each pointer references one contiguous set of 16 Nodes (one contiguous set of 4 Node Groups; one Supernode).
7 2 5 10
Root Node-Group, stored in contiguous memory.
Node-Group
28 15 8 4 16 33 22 11 44 17 72
Supernode, composed of 4 Node-Groups, each composed of 4 Nodes. The entire supernode is stored in contiguous memory.
47 40 45 29 25 19 31 51 42 41 55
25 37 18 35 62
80

FIGURE 8

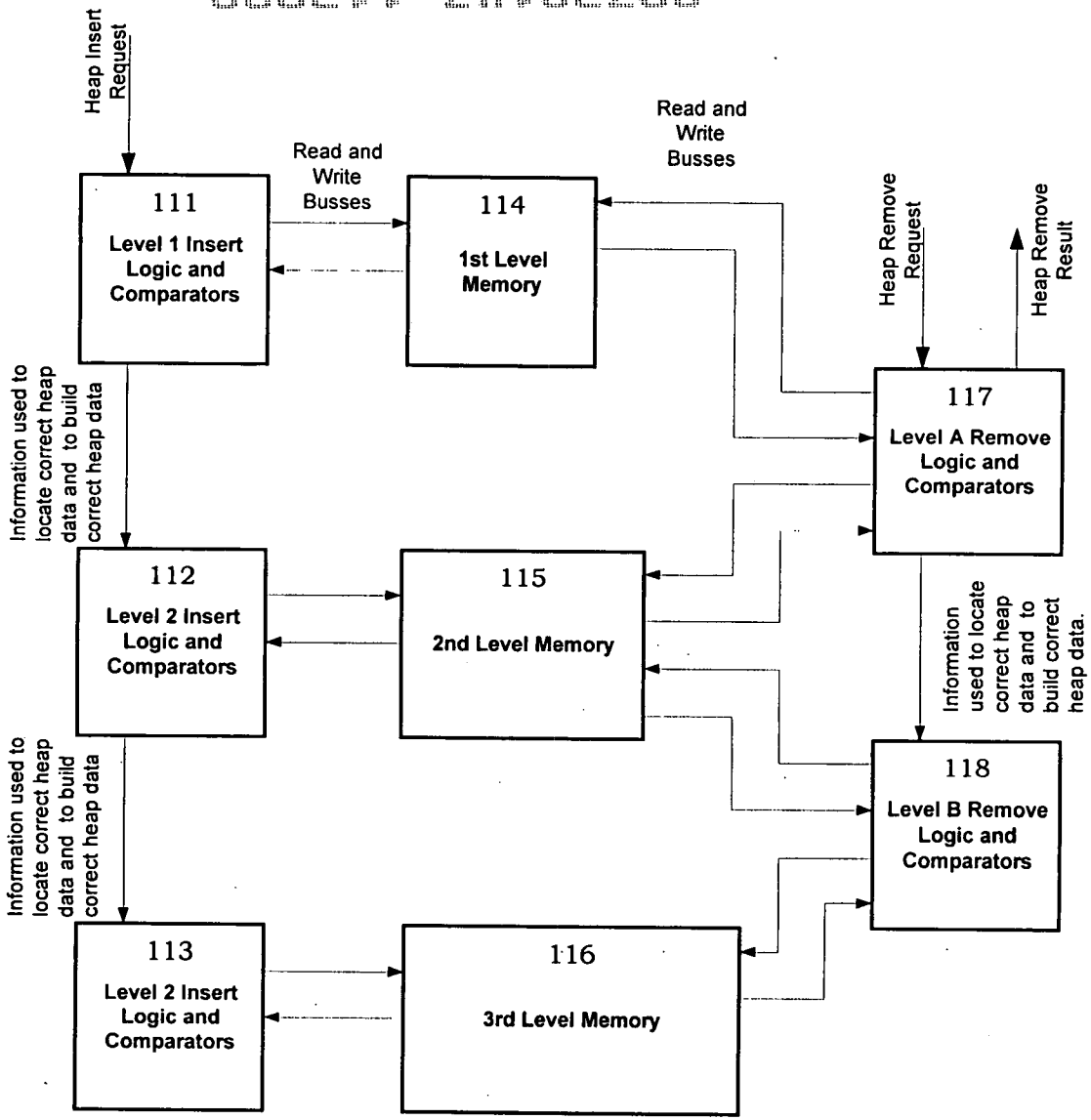

Heap Request
Heap Result
Read and Write Busses
93
1st Level Memory
91
Level A Logic to Implement Heap Operations
94
2nd Level Memory
Information used to locate correct heap data and to build correct heap data
92
Level B Logic to Implement Heap Operations
95
3rd Level Memory

90

FIGURE 9

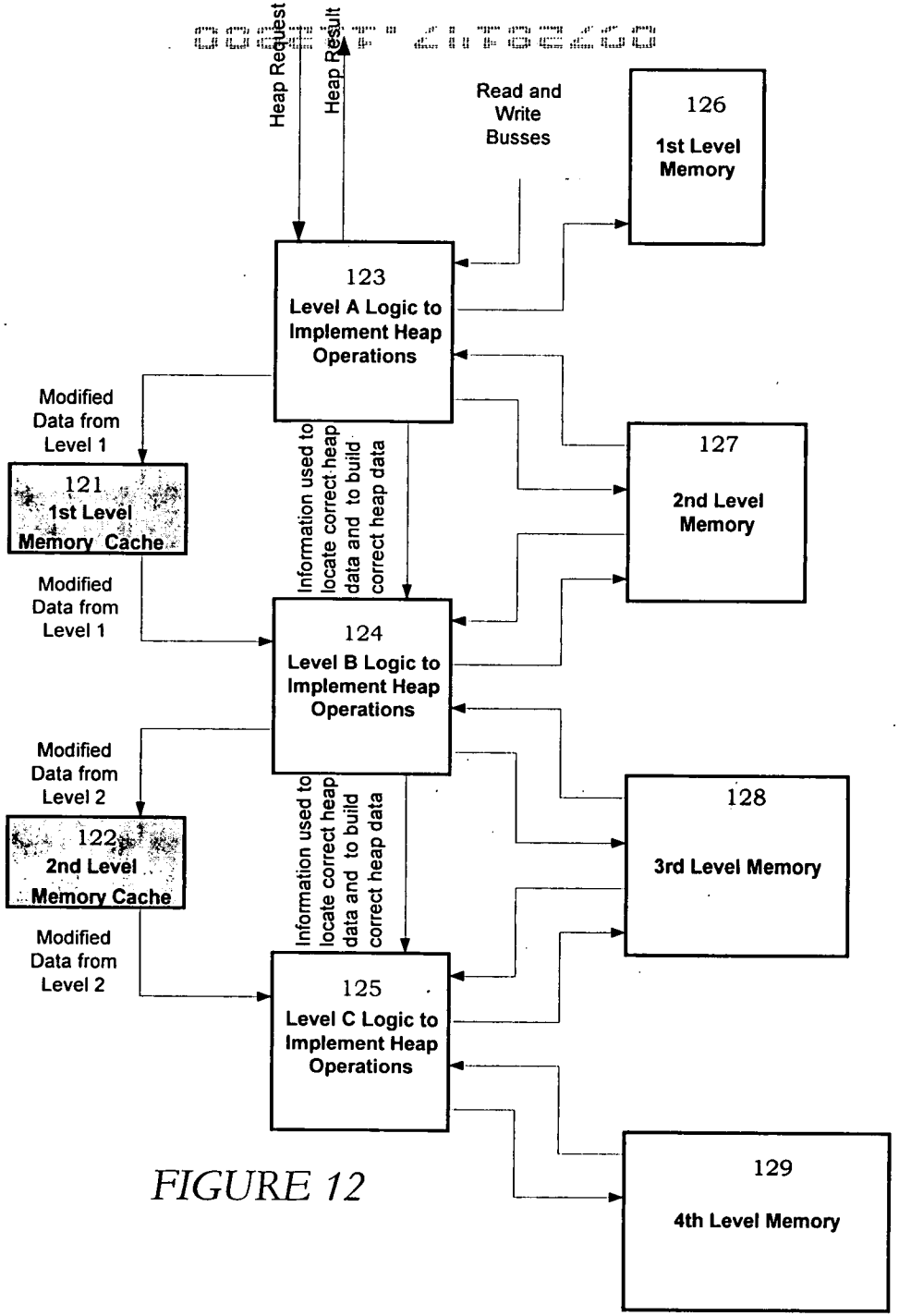
	time ---------->																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Read Level 1 RAM	A						B											
Write Level 1 RAM						A						B						
Level A Comparisons				A	A					B	B							
Read Level 2 RAM			A						B									
Write Level 2 RAM								A						B				
Level B Comparisons						A	A					B	B					
Read Level 3 RAM					A						B							
Write Level 3 RAM										A						B		
Level C Comparisons								A	A					B	B			
Read Level 4 RAM							A						B					
Write Level 4 RAM										A						B		

FIGURE 10



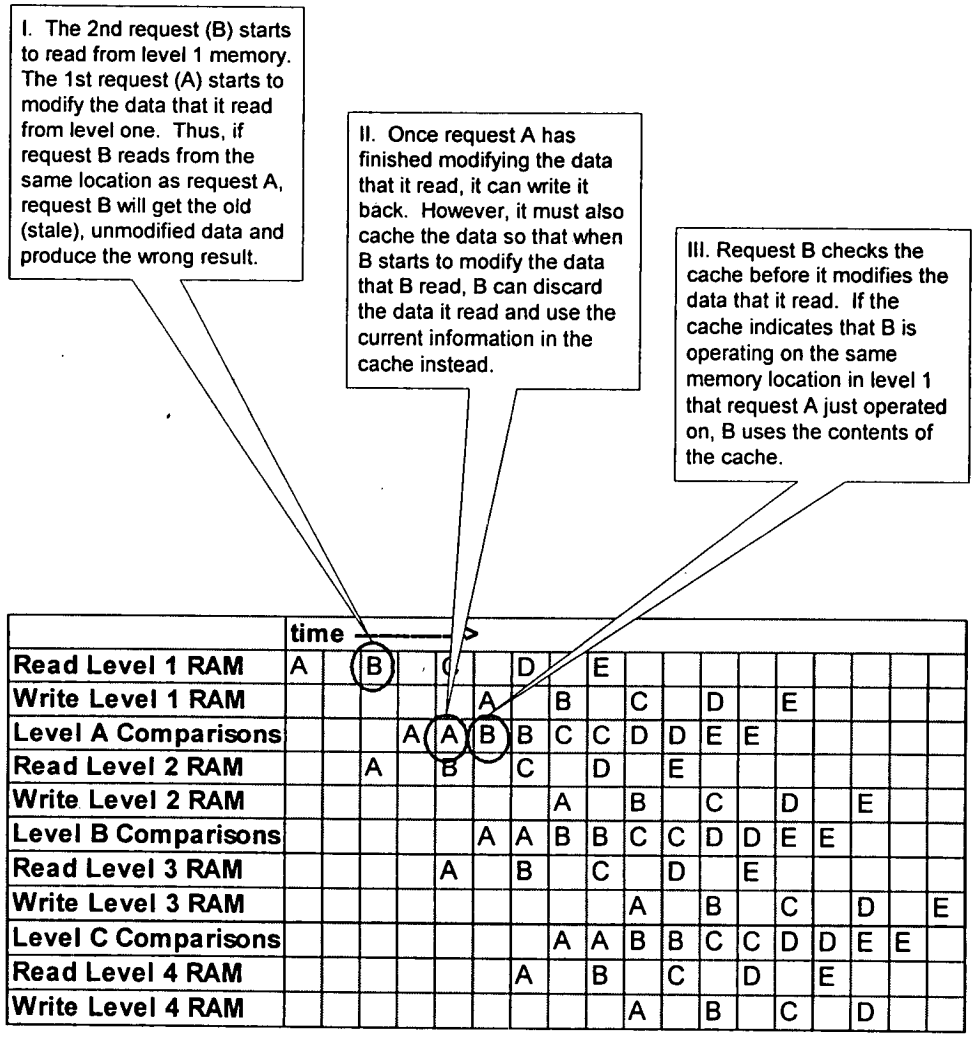
110

FIGURE 11



120

FIGURE 12



130

FIGURE 13